83674

S/048/60/024/009/007/015
B013/B063

24.6720

AUTHORS: Malysheva, T. V., Khotin, B. A., Lavrukhina, A. K., Kryukova, L. N., Murav'yeva, V. V.

TITLE: Investigation of New Neutron-deficient Platinum Isotopes 19

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 9, pp. 1109-1112

TEXT: The authors studied neutron-deficient platinum isotopes which were formed by disintegration of gold induced by 660-Mev protons. The platinum isotopes were studied by spectrum analysis of conversion electrons and on the basis of "genetic" relations. The platinum and iridium fractions of high specific activity were separated from 1-2 g of gold bombarded on the synchrocyclotron of the OIYaI (Joint Institute of Nuclear Research). A series of experiments was carried out, and a method was proposed for the carrier-free separation of platinum and iridium isotopes. This method is based on the separation of their chloride complex compounds by means of anion exchange (Fig. 1). The results of the spectrum analysis of conversion electrons of the iridium fraction are given in Ref. 6. The spectrum of

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the Pt conversion electrons was measured by means of a magnetic, spiral β-spectrometer having a resolution of 0.5%. The experimental spectrum is shown in Fig. 2. The results of measurement of the conversion lines are given in a table. The half-life of the Pt isotopes was determined by separating the daughter iridium from the Pt fraction at regular intervals during one to four hours (Fig. 3). The total half-life of Pt^{186} and Pt^{187} was calculated from the activity of Ir^{186} (T = 15 hours) and Ir^{187} (T = 13 hours) to be 2.5 ± 0.5 hours. This is in agreement with the data of Ref. 6. The half-life of Pt was calculated from the activity of the daughter iridium having a half-life of three hours to be 2.6 ± 0.6 hours. In accordance with Ref. 6, this is the half-life of the new isotope Pt^{184}. There are 3 figures, 1 table, and 10 references: 2 Soviet, 2 Canadian, and 1 German.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR), Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gos. universiteta im. M. V. Lomonosova (Scientific Research Institute of Nuclear Physics of Moscow State University imeni M. V. Lomonosov)

83675

S/048/60/024/009/008/015
B013/B063

26.1640

AUTHORS: Lavrukhina, A. K., Kolesov, G. M., Tan Syao-yen

TITLE: Neutron-deficient Isotopes of Rare-earth Elements of the Cerium Group (Products of the Disintegration of Europium With 660-Mev Protons)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 9, pp. 1113-1118

TEXT: The present paper gives the results of an investigation of the production cross sections of rare-earth isotopes which are produced by the disintegration of europium with 660-Mev protons. A target of 2 to 5 mg of europium oxide (99.8% Eu_2O_3) was irradiated with the inner 660-Mev proton beam of the synchrocyclotron of OIYaI (Joint Institute of Nuclear Research) for 50 min. The fractions were identified from the position of the peaks in the chromatogram (Fig. 1) and the active rare-earth isotopes from the half-life and the radiant energy (Table 1). The yields of isotopes produced by the disintegration of europium are shown in Fig. 2

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Neutron-deficient Isotopes of Rare-earth Elements of the Cerium Group (Products of the Disintegration of Europium With 660-Mev Protons)

Table 2 gives exact data on the composition of the isotopes produced by total decay of all radioisotopes. Finally, the authors briefly describe the separation of the predicted new isotope Pr^{134} (Ref. 7). This isotope originates from Pr^{134} whose half-life was estimated from the activity of Ce^{134m} separated from the daughter fractions to be ~1 hour. The gamma spectrum of the daughter cerium was taken on a 100-channel scintillation gamma spectrometer by Yu. A. Surkov and V. G. Karpushin (Fig. 5). V. V. Malyshev participated in the experiments. There are 5 figures, 2 tables, and 10 references: 8 Soviet.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR)

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83676

S/048/60/024/009/009/015
B013/B063

24.6720

AUTHORS: Surkov, Yu. A., Chernov, G. M., Lavrukhina, A. K., Khromchenko, Z. V.

TITLE: Investigation of Neutron-deficient Osmium Isotopes

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 9, pp. 1119-1123

TEXT: The present paper gives the results of an investigation of neutron-deficient osmium isotopes on the synchrocyclotron of OIYaI (Joint Institute of Nuclear Research). The osmium isotopes were produced by bombarding ~0.2 g of gold with 660-Mev protons for 1 ÷ 2 hours. The purity of the separated elements was radiochemically checked. A 100-channel scintillation gamma spectrometer and β- and γ-counters were used to analyze the beta and gamma emission of the nuclear reaction products. Fig. 1 shows the gamma spectrum of the osmium isotopes obtained. The authors identified Os^{182}, Os^{183}, Os^{183*}, and Os^{185} which had a half-life of at least 10 hours. In addition, the spectrum showed an intense line, E_γ = 230 kev, which had

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Investigation of Neutron-deficient Osmium Isotopes

a half-life of ~2.7 hours. Control experiments indicated the existence of a new osmium isotope having a half-life of three hours. This was confirmed by the study of the daughter osmium (Figs. 3 and 4) and the daughter rhenium (Fig. 5). This neutron-deficient isotope is assumed to be Os^{181} and has a half-life 2.7 hours. By capture of the orbital electron it is converted into Re^{181}. 230-kev gamma quanta are emitted during this conversion. Fig. 2 shows the descending curve of the activity sum of Os, which was measured by an end-window counter. It confirms the correctness of the identification of the isotopes. As there are now only few data available on neutron-deficient Ir, Os, and Re isotopes, the conclusions drawn from the results obtained require further confirmation. The agreement of these results with experiments recently carried out with protons of 10 ÷ 80 Mev (Ref. 1) indicates that the above-mentioned identification is correct. The results further indicate the existence of the isotope Ir^{183} which is formed by the decay of the two isomers Os^{183} and Os^{183}. Furthermore, a 23-min activity of osmium (E_γ = 170 kev) was observed during the experiments. However, the 23-min isotope may well be an isomer

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Investigation of Neutron-deficient Osmium Isotopes

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B003/B063

of some unidentified osmium isotope. The authors thank V. I. Baranov for his interest in this work. There are 6 figures and 2 references: 1 Soviet and 1 Canadian.

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S/020/60/134/006/029/031
B004/B054

AUTHORS: Lavrukhina, A. K., Kolesov, G. M., and Tan Syao-yen

TITLE: Reduction of Rare Earths of the Cerium Group on the Mercury Cathode

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 6, pp. 1406-1409

TEXT: The authors wanted to investigate the behavior of samarium, promethium, and cerium in electrolysis. Mercury was used as cathode, platinum wire as anode. The electrolysis was carried out at pH 5.8 - 6.0, at 0 to +2°C, a concentration ratio of Me^{3+} : CH_3COO^-: $C_6H_5O_7^{3-}$ = 1 : 1 : 2, and a voltage of 10 - 12 v. Radiochemically pure Sm^{153}, Pm^{147}, and Ce^{144} were used. After electrolysis, the quantity of Sm, Pm, and Ce, which had passed over into Hg, was determined by an MCT-17 (MST-17) counter. Sm was also determined gravimetrically. The experimental data are shown in Table 1 and Figs. 1, 2. The separation of samarium depends on the current density only in the range between 25 and 75 ma/cm^2. At higher current density,

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the separation is little influenced by it. At 100 ma/cm^2, already 95% of Sm are separated within 30 min. At a constant concentration of the complex formers, the Sm separation does not depend on them within concentrations from $6 \cdot 10^{-3}$ to $6 \cdot 10^{-2}$. Pm^{147} and Ce^{144} were used in concentrations of about $1 \cdot 10^{-9}$ and $1 \cdot 10^{-12}$ mole. Pm passes over into the amalgam only at current densities higher than 75 ma/cm^2. But even at 100 ma/cm^2, the Pm separation only starts after 30 min and after the formation of a samarium-potassium amalgam with corresponding potential (-2.11 v). The Pm separation depends on the alkali metal used (K, Li). In the presence of K, the Pm only passes over into the Hg cathode if large amounts of Sm or Yb are present. In the presence of Li, the Pm separation is independent of the presence of these rare earths. An addition of potassium citrate bears no influence on the Sm separation, but prevents that of Pm, whereas lithium citrate exerts no influence on the Pm separation. The same results were obtained for cerium as for promethium. The authors arrived at the conclusion that the passing over of Sm, Pm, and Ce into the Hg cathode is due to electrolytic reduction. An intermediate stage is the bivalent state which is polarographically confirmed for La, Ce, Pr, and Nd (Refs. 8-10):

Reduction of Rare Earths of the Cerium Group on the Mercury Cathode

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$Me^{3+} + e^- \rightleftharpoons Me^{2+}$. The authors found the optimum conditions for the quantitative separation of Sm (up to 99.7% within an hour), and established that Pm and Ce pass over into the Hg cathode up to 97%, even if the complex formers are present in a 10^{11} excess. They also clarified the possibility of a separation of these elements. They thank S. I. Sinyakova, Yu. S. Sklyarenko, and O. L. Kabanova for their discussion. There are 2 figures, 1 table, and 10 references: 7 Soviet, 2 US, and 1 German.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo
(Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy)

PRESENTED: June 8, 1960, by A. P. Vinogradov, Academician

SUBMITTED: May 30, 1960

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LAVRUKHINA, A.K.

Report to be submitted for the IUPAC 21st Conference and 18th Intl. Congress of Pure and Applied Chemistry, Montreal, Canada, 2-12 August 1961

GORODYSKIY, O. V., Academy of Sciences UkSSR, Kiev - "The oscillographic investigation of the electrochemical kinetics in fused salts" (Section A.3,e.2 - Session I, 11 Aug 61, afternoon)
GURVICH, L. V., Academy of Sciences USSR, Moscow - "The calculation of thermodynamic functions of gases in a wide temperature range" (Section A.3,c,(1), Session II - 8 Aug 61, afternoon)
KARGIN, V. A., Physico-Chemical Institute imeni L. Ya. Karpov, Moscow - "Vitrification phenomena in crystallin polymers" (Section B.4 - 7 Aug 61, afternoon)
KISELEV, A. V., Moscow State University imeni M. V. Lomonosov - "The influence of surface heterogeneity and adsorbate-adsorbate interaction on the adsorption properties of solid surfaces" (Joint Session, Sections A.2 and B.1 - 8 Aug 61, morning)
KONDRAT'YEV, V. N., Institute of Chemical Physics, Academy of Sciences USSR, Moscow - "The HO_2 radical" (Section A.1, Session I - 11 Aug 61, morning) (Also, Section A.1, Chairman, Session I - 8 Aug 61, morning)
KUZNETSOV, V. I., Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Academy of Sciences USSR - "A novelty in the use of organic co-precipitants for concentration of small amounts of the elements" (To be presented in Russian) (Section C.2 - 11 Aug 61, morning)
LAVRUKHINA, A. K., RAKOVSKIY, E. E., and MOSKALEVA, L. P., Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Academy of Sciences USSR - "New data on radiochemical investigations of the processes of fission and fragmentation induced by high energy protons" (Section A.4 - 8 Aug 61, afternoon)
LOVACHEV, L. A., Academy of Sciences USSR, Moscow - "Determination of rate constants of elementary processes from flame velocities as a function of temperature, pressure, and molecular transfer coefficients" (Section A.3,b,(2) - 7 Aug 61, afternoon)
MUKDIATH, S. (Probably MUDDYATH, S.) and GERASIMOV, Y. I., Moscow State University imeni M. V. Lomonosov - "Study of the thermodynamic properties of the system iron-latinum" (Section A.3,c,(3), Session II(A) - 11 Aug 61, morning)
PANCHENKOV, G. M., KOLCHIN, A. M., MALAKOV, V. P., and SHEVCH, Ya., Moscow State University imeni M. V. Lomonosov - "Emission of complex ions in solid-phase reactions" (Joint Session, Sections A.2 and B.1, 8 Aug 61, morning)
SEMENOV, N. N., Institute of Chemical Physics, Academy of Sciences USSR, Moscow - "Certain chemical reactions at reduced temperatures and related problems of energy transfer" (To be presented in Russian) (Plenary lecture - Saturday, 12 Aug 61)
SHILOV, Ye. A., Academy of Sciences UkSSR, Kiev - "The active agents and the intermediary complexes in the heterolytic reactions of halogenation of the organic compounds" (Section A.1, Session II - 11 Aug 61, morning)
SMIRNOV, M. V., Electrochemistry Institute, Sverdlovsk - "The equilibrium between the titanium subgroup metals and the salt melts" (Section B.3 - 7 Aug 61, afternoon)
TAL'ROZE, V. L., Institute of Chemical Physics, Academy of Sciences USSR - "Reactions of ions and molecules in the gas phase" (Section A.1, Session I - 9 Aug 61, afternoon)
TERENIN, Aleksandr N., Leningrad State University imeni A. A. Zhdanov - (Section A.1, Chairman, Session I - 8 Aug 61, afternoon Session) (Also on program for Section A.1, Session I - 9 Aug 61, afternoon)
TERENIN, Aleksandr N., VILESOV, F. I., KURBATOV, B., and DODONOVA, N., Leningrad State University imeni A. A. Zhdanov - "Mass-spectrometry and luminescence of radicals in the photodissociation and photoionization of molecules by vacuum ultra-violet radiation" (Section A.1, Session I - 9 Aug 61 - afternoon)
TUNITSKIY, N. N., Scientific Research Physico-Chemical Institute imeni L. Ya. Karpov - "On the dissociation of molecules on electron impact and the early states of radiation-chemical processes" (Section A.1, Session I - 8 Aug 61, afternoon)
YANISHEVSKIY, Emmanuil Ye., and MOROZOV, V. V., Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Moscow - "The plasma generator and its use for spectral analysis of alloys and rocks" (Section C.1 - 8 Aug 61, morning)
VINOGRADOV, A. P., LAVRUKHINA, A. K., and REVINA, L. D., Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Academy of Sciences USSR - "The study of nuclear reactions in iron meteorites under the action of high energy protons" (Section A.4 - 8 Aug 61, afternoon)
YAKOVLEV, Yu. V., and ALIMARIN, I. P., Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Academy of Sciences USSR - "The determination of trace impurities in some materials for semiconductor techniques by radio-activation analysis" (To be presented in Russian) (Section C.1 - 8 Aug 61, afternoon)

YEROFEYEV, Boris V., Institute of Physical-Organic Chemistry, Minsk - "The effect of donor and acceptor admixtures on the decomposition rate of solids" (Section A.2 - 8 Aug 61, afternoon)

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B107/B147

3.2440 (1041 only)
3.1900 (1057, 1166)

AUTHORS: Vinogradov, A. P., Lavrukhina, A. K., Revina, L. D.

TITLE: Nuclear reactions in iron meteorites

PERIODICAL: Geokhimiya, no. 11, 1961, 955 - 966

TEXT: The authors report on a radiochemical analysis of the fission products of iron bombarded with 660-Mev protons. They attempted to clarify the cosmogenic formation of various isotopes in iron meteorites. The synchrocyclotron of the Laboratoriya yadernykh problem Ob"yedinennogo instituta yadernykh issledovaniy (Laboratory for Nuclear Problems of the Joint Institute of Nuclear Research) was used to bombard 100 to 500 mg of iron powder with about 10^{12} protons/sec·cm^2 for 0.5 to 2 hr. The resulting isotopes were identified according to half-life, kind and energy of radiation. A simplified magnetic beta spectrometer and a gamma scintillation spectrometer were used for this purpose. A total of 38 isotopes with atomic numbers 4 - 27 and half-lives from 8 min to 3 years were found. The production cross sections and yields of stable and undetected radioisotopes were calculated by interpolation (Fig. 2). On the strength of

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these data, the number of cosmogenic nuclei was calculated, which are formed by fission of Fe^{56} in the center of a meteorite of 10 cm diameter within $4.5 \cdot 10^9$ years (Table 4). Results: Within the period mentioned, about 10^{-7} g of cosmogenic isotopes per gram of meteorite is formed, among them the stable isotopes Ar^{36}, Ar^{38}, K^{40}, Sc^{45}, and V^{50}. The concentration calculated for these isotopes agrees with the observed concentration and is about 10^{-9} g/g of meteorite. This explains the anomalies observed in the isotopic composition of potassium and argon. Shifts toward the ratios in terrestrial rocks are to be expected also for the isotopes of vanadium, titanium, and other elements. The equilibrium values for the activity of long-lived cosmogenic nuclei in iron meteorites were calculated. A comparison with values measured in various meteorites shows deviations by a factor of ≤ 5. The mean production cross section for nuclei with an atomic weight of about 20 and about 40 was found to be 1.2 and 0.5 Bev. The authors thank V. V. Malyshev, L. M. Saratova, and Su Hung-kuei for help in the experimental work. L. K. Levskiy and V. Kuznetsov are mentioned. There are 4 figures, 7 tables, and 30 refer-

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S/186/61/003/006/006/010
E051/E135

AUTHORS: Lavrukhina, A.K., Kolesov, G.M., and T'ang Hsiao En

TITLE: The separation of irradiated samarium from radioactive rare earth elements by electrolysis with a mercury cathode

PERIODICAL: Radiokhimiya, v.3, no.6, 1961, 724-731

TEXT: Neutron-deficient elements of the cerium group of rare earth elements can be produced by bombardment, with high-energy particles, of a samarium oxide target weighing 100 mg or more. After the irradiation the major part of the samarium must be removed before using an ion-exchange chromatographic procedure for the complete separation of the isotopes produced. Previous experience had shown that electrolysis with a mercury cathode would serve to remove most of the samarium, although other rare earth elements, especially promethium, showed a tendency to be co-deposited. Various factors were studied in an attempt to improve the samarium removal and decrease the other rare earth loss. Electrolysis was carried out in a cell made from a

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separating funnel (37 mm diameter), ice-jacketed to keep the cell at 0-2 °C. The cathode was 15 mℓ of purified mercury and the anode 25 cm of 0.8-1.0 mm diameter platinum wire, wound in a spiral. Current to the cell was supplied at 10-12 volts from a stabilised selenium rectifier circuit. Both mercury and electrolyte were stirred at 500 r.p.m. The samarium target material was shown by spectrographic analysis to contain ~0.5% Eu_2O_3, < 0.01% Gd_2O_3, and small amounts of Cu, Fe, Aℓ, Si, Mg and Mn. Radioactive tracers Sm^{153}, Pm^{147} and Ce^{144} were added as required. The radiochemical purity of the tracers was checked by half-life measurements, β-ray absorption in aluminium and by the absence of γ-radiation. The solution for electrolysis was prepared by dissolving the target material in 10 mℓ of 25% acetic acid, excess of which was removed by evaporating the solution until crystals of samarium acetate appeared. The residue was dissolved in 6-8 mℓ of 3.8% potassium citrate solution and transferred to the cell using 2-4 mℓ of the potassium citrate solution as washings, giving a solution of pH 5.8-6.0. After an electrolysis the cathode mercury was run out of the cell with

the current switched on still, and washed with water to decompose potassium amalgam. The remaining samarium amalgam was decomposed with 6N HCl and samarium oxalate precipitated. From the exhausted electrolyte SmF_3 was precipitated; this was dissolved in 30% HNO_3 saturated with H_3BO_3 and $Sm(OH)_3$ or Sm_2Ox_3 precipitated. The precipitates were ignited at 85 °C and weighed. 0.05-0.10 m aliquots of the electrolyte were assayed for Sm^{153}, Pm^{147} and Ce^{144} activity. A loss of about 1% of the activity occurred due to absorption on the glass walls of the cell, 0.1-0.3% loss occurred when the potassium amalgam was decomposed, and other losses amounted to about 0.02%. The effects of electrolysis time, cathodic current density, samarium concentration and the substitution of lithium citrate for potassium citrate were examined, keeping the citrate concentration constant.
At 100 mamp/cm^2 current density, after 30 min. electrolysis, 4.6% of the samarium and 99.9% of the promethium were left in the electrolyte. After 45 min the figures were 3.6% samarium and 59% promethium remaining in the electrolyte. Cerium was removed from solution slowly but continuously, the deposition increasing

The separation of irradiated ...

with increasing cerium concentration. At current densities of 25 and 50 mamp/cm^2 no promethium was deposited in 1.5 hours, but at 100 mamp/cm^2 83% was deposited. Samarium deposition increased sharply from 25 to 75 mamp/cm^2 with a slight increase at higher current densities. From 10^{-6}-10^{-4} M samarium the quantity deposited remained ~93%; from 10^{-4}-6 x 10^{-2} M the quantity deposited rose to 97.6%; above 6 x 10^{-2} M the quantity decreased due to precipitation of basic samarium acetate. By replacing potassium citrate by lithium citrate, the deposition of samarium was improved, leaving 0.3% in the electrolyte after one hour's electrolysis at 100 mamp/cm^2, but at the same time 96.8% of the promethium was deposited in the mercury cathode. The optimum conditions for the separation of samarium on a mercury cathode in the presence of potassium citrate were found to be: 6 x 10^{-2} to 6 x 10^{-3} M samarium concentration, 100 mamp/cm^2 current density, 60 minutes electrolysis time, and molar ratio Sm^{3+}:Cit^{3-} = (1:2) - (1:20). Under these conditions the yield of

samarium reaches 97.6%. By replacing K with Li, a yield of 99.7% was obtained. Previous work had shown that promethium and cerium only start to be deposited in a mercury cathode after the formation of a mixed potassium-samarium amalgam, and the extent of deposition depends on the potassium citrate concentration. By changing the cathode mercury during the course of an electrolysis an improvement is gained in samarium deposition without any deposition of promethium. With two changes of mercury at 100 mamp/cm^2, 97.5% of the samarium can be removed from the electrolyte without loss of promethium. With three changes of mercury, 9% of the promethium was deposited. If 400 mg of potassium citrate was added during the course of an electrolysis, although no improvement in samarium separation occurred, no promethium was removed from the electrolyte at all. Using these latter conditions a samarium oxide target which had been bombarded with 660 MeV protons was treated. After the major part of the samarium had been removed by electrolysis an ion-exchange chromatographic procedure separated isotopes of Sm, Pm, Nd, Pr, Ce and La.

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There are 5 figures, 5 tables and 19 references: 13 Soviet-bloc, 1 Russian translation from non-Soviet-bloc publication, and 5 non-Soviet-bloc. The English language references read as follows:

Ref. 2: H.N. McCoy, J.Am.Chem.Soc., v.63, 6, 1622 (1941).
Ref. 3: H.N. McCoy, J.Am.Chem.Soc., v.63, 12, 3432 (1941).
Ref. 4: I.K. Marsh, J.Chem.Soc., 531 (1943).
Ref.11: E.I. Onstott, J.Am.Chem.Soc., v.78, 10, 2070 (1956).

SUBMITTED: May 26, 1960

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S/056/61/040/002/003/047
B113/B214

AUTHORS: Lavrukhina, A. K., Rakovskiy, E. Ye., Su Khun-guy, Khoynatskiy, S.

TITLE: Nuclear fission of antimony by high-energy protons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 409-418

TEXT: The nuclear fission products of antimony due to 660-Mev protons have been investigated to obtain the main characteristics of this process: mass spectrum, isotopic composition of the fission fragments, distribution of the nuclear charge, and the amount of the cross section. The target for irradiation was prepared from metallic antimony which was purified (spectrally pure) by repeated zone melting. The antimony target was coated with aluminum which served as a monitor for the determination of the proton flux according to the reaction $Al^{27}(p,3\,pn)Na^{24}$. This target was irradiated in the inner beam of the synchrocyclotron of the LYaP OIYaI (Laboratory for Nuclear Problems of the Joint Institute of Nuclear Research) for 0.5 - 3 hr. The elements of atomic numbers 11-37

Nuclear fission of antimony...

were separated by chemical methods. The activity of the preparations was determined by the MCT-17 (MST-17) end-window counter. For the identification of the individual activities, the sign of the radiation was determined in a magnetic analyzer. Two groups of products could be identified from the data on half-life, mode of disintegration, and mean production cross section. Between Rb and Zn ($Z \geq 30$) are isotopes whose yield decreases rapidly with increasing $\Delta Z = Z_0 - Z$ (Z_0 is the atomic number of the initial nucleus). The range $16 \leq Z \leq 28$ is to be attributed to the fission products for which no change in the yield was observed with a change in Z. The interpolation method was used for estimating the yield of the unidentified, stable, long- and short-lived radioactive fission fragments from antimony. It is seen from Fig.2 that the main part of fission fragments lies in the immediate neighborhood of the broken line of stable nuclei. The character of distribution of the fragment yield from antimony in A and Z can be determined from the totality of the experimental and interpolated data. The mass distribution curve of the isotopic yield is dome-shaped. On the fission

of antimony nucleus there occurs a considerable increase in the relative amount of neutron-deficient isotopes. σ and the amount of the most probable charge Z_p was determined for all isobars between A = 37 and A = 62. It was found that $Z_p(A)$ lies very near the line of stable nuclei. The charge distribution is constant for all the isobars. Fig. 8 shows the distribution curves of the total yield as a function of Z for the fission fragments of antimony, holmium, bismuth, and uranium nuclei. It is also seen from Fig. 8 that the increase in the nuclear charge of the target makes the curve broader which indicates that the contribution of the asymmetric fission increases with increasing charge of the fissioned nucleus. A comparison of the curves in Fig. 8 shows that the yield of fission fragments of antimony nuclei is significantly smaller than that of the heavier nuclei. The total cross section for nuclear fission of antimony by 660-Mev protons was found to be 0.25 mb. From the results obtained it is possible to conclude that a regular change in all the fundamental parameters of the fission process is connected with the change in the charge of the target nucleus. V. N. Mekhedov and T. B. Malyscheva are thanked for their valuable advice; L. D. Revina,

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Nuclear fission of antimony...

L. D. Firsova, and I. S. Kalicheva are thanked for their help in the experimental part of the work. Yu. V. Yakovlev, L. A. Smakhtin, V. Shamov, and V. V. Malyshev are mentioned. There are 8 figures, 2 tables, and 18 references: 15 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry of the Academy of Sciences USSR)

SUBMITTED: July 8, 1960

Legend to Table 1: Yields of identified fission fragments from antimony bombarded by 660-Mev protons. 1) Element, 2) atomic weight, 3) mode of disintegration, 4) experimental half-life, 5) half-life taken from tables. ЭЗ - electron capture, ИП - isomeric transition, час - hour, дн - day, мин - minute.

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S/020/61/137/003/008/030
B104/B214

AUTHORS: Lavrukhina, A. K., Malysheva, T. V., and Khotin, B. A.

TITLE: A new Ir^{183} isotope

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 3, 1961, 551-552

TEXT: On separation of the daughter osmium from the iridium fraction produced by the disintegration of gold by 660-Mev protons, an activity with the half-life of 12 hours was discovered which belongs to Os^{183}. This fact confirms the formation of a new neutron deficient iridium isotope with the mass number 183 in the disintegration product of gold. The present paper is concerned with the determination of the half-life of Ir^{183}. 0.5 g of metallic gold was irradiated for 0.5 - 1 hr by 660-Mev protons with the synchrocyclotron of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research). The radioactive, pure iridium was obtained from the disintegration products of gold by a method described in an earlier paper of the present authors (Ref. 3: A. K. Lavrukhina et al. III soveshch. po neytronodefitsitnym

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A new Ir^{183} isotope

S/020/61/137/003/008/030
B104/B214

izotopam, g. Dubna, 1960). Then, the daughter osmium was separated from the iridium in the same time interval. (The time of accumulation was changed in the different experiments from 1.5 to 4 hr). For this purpose, 20 mg of osmium in the form of Na_2OsO_4 was added to a solution of the radioactive iridium. The OsO_4 was extracted with hydrochloric acid and fixed with 10% NaOH. Thereafter the osmium sulfide was precipitated and annealed to metal in a current of hydrogen. The degree of separation of osmium was checked by weighing the metallic osmium. The chemical yield was 95-98%. The decrease in radioactivity was measured by an end-window counter. Fig. 1 shows the decay curves of the activity of osmium determined at intervals of 1.5 hr for the 4th and 7th separations. Half-lives of 10 minutes, 12 hr and 90 days were measured. It is obvious that the activity caused by Os^{183} is the greatest part of the activity of osmium. In the osmium separated 12 hr after the first iridium separation (9th separation, Fig. 2) the 12-hr activity was no more present. From Fig. 3 appears a half-life of 1 ± 0.1 hr for Ir^{183}. An activity with the half-life 1 ± 0.15 hr could be established also from the decay curve of the total activity of the iridium fraction. The activity with

A new Ir^{183} isotope

S/020/61/137/003/008/030
B104/B214

the half-life of 90 days is due to the formation of Os^{185} from the 15-hr Ir^{185}. The activity with the half-life of 10±2 minutes belongs to the osmium isomer Os^{190m}. There are 3 figures and 3 Soviet-bloc references.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, Academy of Sciences USSR)

PRESENTED: October 10, 1960, by A. P. Vinogradov, Academician

SUBMITTED: September 23, 1960

Card 3/4

21489
S/020/61/137/004/013/031
B104/B206

24.6600 (1138, 1098)

AUTHORS: Lavrukhina, A. K., Rakovskiy, E. Ye., Su Hung-kuei, and Khoynatskiy, S.

TITLE: Fast-proton induced fission of antimony nuclei

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 4, 1961, 826-829

TEXT: The difficulties in the experiments described here mainly consisted in that the fission fragments of antimony nuclei possess very small yields as compared with those of the disintegration products. 10^{-3} % of impurities lead to strong deviations from the correct results. High-purity targets had therefore to be used. The targets were irradiated in the synchrocyclotron of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) with 660 Mev protons; the products were chemically separated (Z = 11 - 37). Great difficulties occurred here too, since antimony fission products are often identical with antimony disintegration products. The isotope production cross sections were calculated by conventional methods. The results are compiled in Table 1. As can be seen from the diagram in Fig. 1, the fission of Sb takes place in a much

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Fast-proton induced fission of...

wider interval of the ratio n/p as is the case for heavy nuclei. With it, however, the share of neutron-deficient nuclei is also greater than for heavy nuclei. Most of the nuclei identified by the authors are "protected" (zashchishchennyy) isobars, which makes it possible to determine the little known distribution of the nuclear charge on the fission of Sb. The distribution of the isobaric output is shown in Fig. 2. The half-widths of the curves for the individual isobars are 3-4 unit charges, while the same half-widths amount to 2-3 unit charges for the fission of heavy nuclei. The line which connects the most probable nuclear charges of the fragments lies close to the line of nuclear stability. The fact is also mentioned that the Sb fission takes place symmetrically (Fig. 2), which is similar to the fission of Ag. With a reduction of the proton energies to 220 Mev, the portion of asymmetric fission products is reduced. As it turned out, the fission of Sb is accompanied by an average emission of 7 protons. From Table 2 it can be seen that the fission cross section increases with increasing Z of the target nucleus. The total fission cross section for Sb with 660 Mev-protons is 0.25 millibarn. This value almost equals that determined on Ag for the same proton energies. (0.32 millibarn). The authors thank V. N. Mekhedov, L. D. Revina and L. P. Moskaleva for advice

Fast-proton induced fission of...

and assistance. There are 3 figures, 2 tables, and 13 references: 9 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR)

PRESENTED: October 10, 1960, by A. P. Vinogradov, Academician

SUBMITTED: September 23, 1960.

X

29014
S/020/61/140/004/015/023
B106/B110

5.2100

AUTHORS: Kourzhim, V., Lavrukhina, A. K., and Rodin, S. S.

TITLE: Use of ammonium phosphotungstate for the separation of rubidium and cesium by ion exchange

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 140, no. 4, 1961, 832-834

TEXT: J. van R. Smith and co-workers (Ref. 10, see below) recently published a paper on the separation of alkali metals on an exchanger column with ammonium phosphomolybdate. J. Krtil and V. Kourim (Ref. 11, see below) showed that the chemical stability of ammonium phosphotungstate in neutral and highly acid solution was higher than that of ammonium phosphomolybdate, and that the sorption capacity sorb of the former salt was twice that of the latter. On the basis of these data, the authors studied the separation of the heavy alkali metals rubidium and cesium on a column filled with ammonium phosphotungstate. To reduce the high hydraulic resistance of fine-crystalline ammonium phosphotungstate, a coarse packing had to be added. A fine-fibered tremolite asbestos of the amphibolic type was used for this purpose. Silica gel, glass wool.

Card 1/4

Use of ammonium phosphotungstate ...

cellulose, and cork crumbs were less suitable. The column used had an inside diameter of 5 mm, and was filled with a suspension of asbestos in 1 M NH_4NO_3 solution up to a height of about 30 mm. A 0.2 M solution of phosphotungstic acid, and then a 0.3 M NH_4NO_3 solution, were passed through this column. 0.1 ml of a 1 M HNO_3 solution was then introduced which contained 10^{-4} M rubidium (radiolabeled with Rb^{86}) and 10^{-6} M cesium (radiolabeled with Cs^{134}). The absorption of β-radiation by an aluminum filter was used to identify the activities since the energies of β-particles of Rb^{86} (1.79 Mev) and Cs^{134} (0.65 Mev) are highly different. A filter of a thickness of 204 mg/cm^2 was used. The radioactivity of fractions obtained after separation on the column was measured in an end-window counter of the MCT-17 (MST-17) type with and without aluminum filter. The relative quantities of the two active isotopes in the fractions were calculated from the following equations:
$A_{Rb} = 6.82 \cdot A_{Al} - 0.31 \cdot A_{tot}$; $A_{Cs} = 1.31 \cdot A_{tot} - 6.82 \cdot A_{Al}$; ($A_{Rb}$, A_{Cs} - activities of Rb^{86} and Cs^{134}, respectively; A_{Al} - total activity when

Card 2/4

Use of ammonium phosphotungstate ...

measuring with filter; A_{tot} - total activity without filter). Rubidium was eluted from the column, with 1 M ammonium nitrate solution cesium with 6 M ammonium nitrate solution. Fig. 1 shows the resultant chromatogram. Rb and Cs can also be separated by ammonium silicomolybdate, but this salt is more soluble in NH_4NO_3 solution than ammonium phosphotungstate, and is therefore, slowly eluted from the column. The chromatograms obtained with ammonium phosphomolybdate agree with data in Ref. 10 (see below). Ammonium silicotungstate cannot be applied to chromatographic separations because of its good solubility in ammonium nitrate solutions. The chromatographic separation method described may be valuable for the separation of highly active isotopes of rubidium and cesium since phosphotungstates are very stable to radiation. There are 1 figure and 16 references: 3 Soviet and 13 non-Soviet. The three most recent references to English-language publications read as follows: Ref. 10: J. van R. Smith, W. Robb, I. I. Jucobs, J. Inorg. and Nucl. Chem., 12, 104 (1960); Ref. 11: J. Krtil, V. Kouřim, J. Inorg. and Nucl. Chem., 12, 367 (1960); A. K. Lavrukchina, A. A. Pozdnjakov, S. S. Rodin, Intern. J. of Appl. Rad. and Isotopes, 9, № 1-4, 34 (1960).

Card 3/4

Use of ammonium phosphotungstate ...

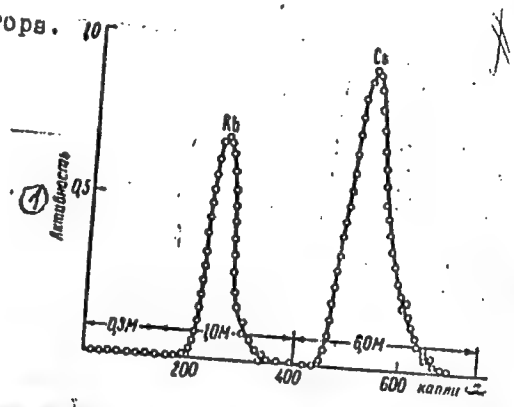
29014
S/020/61/140/004/015/023
B106/B110

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR)

PRESENTED: April 6, 1961, by A. P. Vinogradov, Academician

SUBMITTED: March 4, 1961

Legend to Fig. 1: (1) activity; (2) drops.



Card 4/4

LAVRUKHINA, A.K.

JUN 25 1963

PHASE I BOOK EXPLOITATION

RUN/6244

Lavruhina [Lavrukhina], A. K.

Succesele chimiei nucleare. Bucharest, Ed. Stiintifică, 1962. 144 p. Errata slip inserted. 5100 copies printed.

Transl. of Uspekhi yadernoy khimii (Achievements in Nuclear Chemistry). Moskva, Izd-vo AN SSSR, 1959. 143 p. (Series: Akademiya nauk SSSR. Nauchno-populyarnaya seriya)

Ed.: P. Hodorogea; Tech. Ed.: Gh. Popovici.

PURPOSE: This book is intended for general readers interested in nuclear chemistry.

COVERAGE: The book, a translation from the Russian, is a review of the progress made in nuclear chemistry up to 1962.

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Achievements in Nuclear Chemistry RUM/6244

TABLE OF CONTENTS [Abridged]:

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AVAILABLE: Library of Congress

SUBJECT: Chemistry

BN/wro/jk
5/3/63

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LAVRUKHINA, Avgusta Konstinovna; KOLESOV, Gennadiy Mikhaylovich; PODOSHVINA, V.A., red.; MAZEL', Ye.I., tekhn. red.

[Formation of chemical elements in cosmic bodies] Obrazovanie khimicheskikh elementov v kosmicheskikh telakh. Moskva, Gosatomizdat, 1962. 171 p. (MIRA 15:12)
(Chemical elements) (Cosmogony)

LAVRUKHINA, A.

Stars narrate. Nauka i zhyttia 12 no.6:20-22, 1 of cover Je '62. (MIRA 15:7)

(Chemical elements) (Stars)

S/056/62/043/001/001/056
B154/B108

AUTHORS: Lavrukhina, A. K., Moskaleva, L. P., Malyshev, V. V., Safarova, L. M.

TITLE: Production of light nuclei by bombarding heavy elements with 660 Mev protons

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 1(7), 1962, 3-7

TEXT: The authors investigate the cross sections σ for the production of Be^7, F^{18}, Na^{24}, Mg^{28}, Si^{31}, P^{32} by 660 Mev proton bombardment of Al, Cu, Sb, Sn, Bi, U. The relative contributions of fission and fragmentation in Na^{24} production are estimated from the energy and angular distributions of the Na^{24} nuclei produced by bombarding Cu. The Al, Cu, Sb, and U targets were bombarded in the usual way (A. K. Lavrukhina, et al. Atomn. energ., 3, 285, 1957); Sn and Bi were kept in special graphite containers. The authors conclude that the production of Si^{31} and P^{32} by bombarding

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S/056/62/043/001/001/056
B154/B108

Production of light nuclei by ...

Cu and neighboring elements is a result of spallation and symmetric fission. Formation of lighter isotopes from all target nuclei occurs via fission and fragmentation. The ratio $\frac{\sigma(Na^{24})}{\sigma(F^{18})}$ is always >1 and amounts to 2.5, 5.0, 2.8, 1.3 and 1.8 for Cu, Sb, U, Bi and Sn, respectively. The measured values of σ in the bombardment of Bi are virtually equal for all light nuclei which may be due to the spherical symmetry of these nuclei. The energies of the fragments from Cu fission (Na^{24} nuclei) in the angular interval of 15-80° are greater and the energies in the angular interval of 100-160° are smaller than the Coulomb repulsion of Na^{24} (20 Mev) so that asymmetric fission is supposed. The considerable anisotropy observed in the angular interval of 10-30° and the fragments with energies greater than that of Coulomb repulsion are indicative of fragmentation contributing to the process. The integral yield in fragments of a certain type depends on the "separation energy" $E = m_B + m_F - m_A$ (m_A - mass of target nucleus, m_F - mass of fragment, m_B - mass of additional fragment).

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Production of light nuclei by ...

S/056/62/043/001/001/056
B154/B108

There are 2 figures and 3 tables.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry of the Academy of Sciences USSR)

SUBMITTED: December 26, 1961 (initially)
March 27, 1962 (after revision)

Card 3/3

TRIFANOV, Dmitriy Nikolayevich; LAVRUKHINA, A.K., doktor khim. nauk, otv. red.; ALMAZOV, A.B., red. izd-va; DOROKHINA, I.N., tekhn. red.

[If there were no uranium and thorium] Esli by ne bylo urana i toriia. Moskva, Izd-vo Akad. nauk SSSR, 1963. 85 p. (MIRA 16:5)

(Chemical elements) (Nuclear geophysics)

LAVRUKHINA, Avgusta Konstantinovna; MALYSHEVA, Tamara Vladimirovna; PAVLOTSKAYA, Fanni Il'inichna; BARANOV, V.I., prof., otv. red.; DRAGUNOV, E.S., red.; GUSEVA, A.P., tekhn. red.

[Radiochemical analysis] Radiokhimicheskii analiz. Moskva, Izd-vo AN SSSR, 1963. 219 p. (MIRA 16:12)
(Radiochemistry)

LAVRUKHINA, A.K.; YUKINA, L.V.; KHROMCHENKO, Z.V.

Extraction of rare-earth elements. Trudy Kom.anal.khim. 14: 202-208 '63. (MIRA 16:11)

LAVRUKHINA, A.K.; REVINA, L.D.; MALYSHEV, V.V.; SATAROVA, L.M.; SU KHUN-GUY [Su Hung-kuei]; KALICHEVA, I.S.; FIRSOVA, L.D.

Further study of the proudcts of iron spallation by 660 MeV protons. Radiokhimiia 5 no. 6:721-732 '63. (MIRA 17:7)

AMAR NAT; LAVROKHINA, A.S.

Separation of lead and thallium from the products of bismuth photodisintegration. Radiokhimiia 5 no. 6:732-736 '63. (MIRA 17:7)

S/063/63/008/002/015/015
A057/A126

AUTHORS: Lavrukhina, A.K., Malyshev, V.V., Rodin, S.S.

TITLE: The application of zirconium molybdate and titanium dioxide to the group separation of elements

PERIODICAL: Zhurnal vsesoyuznogo khimicheskogo obshchestva imeni D.I. Mendeleyeva, v. 8, no. 2, 1963, 227 - 229

TEXT: The separation of elements by means of ion-exchange columns filled with zirconium molybdate and titanium dioxide was investigated. In the present paper results are given on the separation of the basic fission elements Rb and Cs from Sr and Ba, and from rare earths. Zirconium molybdate was prepared by very slow addition of 200 ml 1.4 M ammonium molybdate solution to 400 ml 1.2 M zirconium chloroxide solution at vigorous stirring, which was continued after the precipitation for 15 min. The precipitate was filtered off, washed for 24 h and dried for 100 h. If suspended in water, 0.2 - 0.5 mm diameter particles were obtained. The same technique was applied to the preparation of titanium dioxide from 200 ml 7% titanium tetrachloride solution and a 20% surplus of 20%

ammonia solution. The obtained inorganic ion exchange substances were filled into glass columns (5 cm long, 0.5 cm^2 inner cross section), 2 cm high. In preliminary experiments the sorption of Rb^{86}, Cs^{134}, Fr^{212} and Sr^{90} was determined by the batch technique using the hydrogen and ammonia form respectively of the exchange substance. Rb, Cs, and Fr did not adsorb on the ammonia form neither from the neutral nor from the 0.3 M NH_4Cl solution, while Sr adsorbed with 87.5%. From 0.3 M HCl 11.8% Cs, 14.2% Fr, but no Sr was adsorbed by zirconium molybdate. The effect of separation of Sr^{90} with 0.1 M HCl from Cs^{134} with 4 M NH_4NO_3 or from Pr^{142} with 4 M NH_4NO_3 on zirconium molybdate in H^+ form is incomplete, since about 10% of the cesium activity remains on the columns. Cs^{134} was eluted with 95 - 97% efficiency using as eluent a mixture of 4 M NH_4NO_3 and 2 M HCl. The method was developed for the separation of short lived radioisotopes and of highly active products respectively. There is 1 figure.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR (Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy AS USSR)

SUBMITTED: May 28, 1962

S/048/63/027/001/042/043
B108/B180

AUTHORS: Lavrukhina, A. K., Moskaleva, L. P., and Kuznetsova, R. I.

TITLE: Some new data on the mechanism of the formation of light nuclei

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 1, 1963, 137-140

TEXT: Earlier work (Report on the 19. Congress on Pure and Applied Chemistry, Canada, 1961) is continued on the production of light nuclei under bombardment by fast protons. This study covers the energy distribution of Na^{24} produced from Al, Ag, and U by bombardment with 660-Mev protons. To establish a dependence on the proton energy the authors also studied the production cross sections and the angular distributions of some light nuclei produced by 120-Mev protons. The production cross sections of Be^{7}, F^{18}, Na^{24}, and P^{32} from Sb, Sn, and U have the same course for 660-Mev and 120-Mev protons, but are in the former case higher by about one order of magnitude. The ratio of the

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Some new data on the mechanism ...

yields in Na^{24} and F^{18} is somewhat lower for 120 than for 660 Mev. For an Sb target it is 1.6, 2.2 for Sn, and 2.1 for U. These data disprove the meson mechanism of momentum transfer in the nucleus. This paper was read at the 12. Annual Conference on Nuclear Spectroscopy, Leningrad, January 26 - February 2, 1962. There are 4 figures and 3 tables.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy of the Academy of Sciences USSR)

MOSKALEVA, L.P.; LAVRUKHINA, A.K.

Angular and energy distributions of Na^{24} nuclei emitted during the irradiation of aluminum by 660 Mev. protons. Izv. AN SSSR. Ser. fiz. 27 no.10:1270-1272 O '63. (MIRA 16:10)

L 10198-63 EPF(c)/EPF(n)-2/EWT(m)/BDS--AFFTC/ASD/SSD--
Pr-4/Pu-4
ACCESSION NR: AP3000029 S/0056/63/044/005/1429/1436

AUTHOR: Lavrukhina, A. K.; Revina, L. D.; Malyshev, V. V.; Satarova, L. M. 68 65

TITLE: Spallation of Fe Nuclei induced by 150-MeV protons

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1429-1436

TOPIC TAGS: Nuclear reactions, iron, low-energy protons, spallation, isotope distribution

ABSTRACT: Continuing their earlier work on the spallation of iron isotopes by 660-MeV protons (Geokhimiya, no. 11, 955, 1961 and Radiokhimiya, in press), the authors studied nuclear reactions at lower energies, aimed at clarifying volume effects in the distribution of cosmogenic nuclides in meteorites. To this end, the main features of spallation of iron nuclei by 150-MeV protons were studied. An empirical equation is found for the production cross sections of the spallation products. The majority of the product nuclei were found to be near the bottom of the stability valley. The weighted numbers of the emitted neutrons and protons are 2.9 and 2.7, respectively. The cross section for the

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inelastic cross section of 150-MeV protons with iron nuclei is 568 plus or minus 162 mb. The considerable difference between the distributions of the products at 150 and 660 MeV proton energies is probably due to the formation, absorption, and scattering of pions, which increases the probability of transferring large excitation energy to a nucleus at 660 MeV proton energy. Comparison of the total cross section for the inelastic interaction of the iron nuclei with the protons at the two energies with optical-model calculations yields and estimate for the radius of the Fe-56 nucleus, namely (1.21) 10 sup -13 cm. 'The authors express their gratitude to I. S. Kalicheva, L. D. Firsova, and T. I. Kholodkovskaya who took part in this work.'

ASSOCIATION: none

SUBMITTED: 060ct62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 005 OTHER: 016

bm/CL
Card 2/2

S/020/63/148/005/010/029
B102/B186

AUTHORS: Lavrukhina, A. K., Kolesov, G. M.

TITLE: New neutron-deficient isotopes of the cerium group of rare-earth elements

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 5, 1963, 1047 - 1048

TEXT: A 99.96% Pr_6O_{11} target was bombarded by 660-Mev protons in the synchrotron of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research), the rare-earth elements were chromatographically separated and Ce was obtained by extraction, as a radiochemically pure product. The measurements were made with an МТС-20 (MTS-20) end-window counter, and a gamma scintillation spectrometer with a 100-channel pulse-height analyzer. The Pr^{134} halflife was determined by separating the 3.1-day Ce^{134} from the irradiated praseodymium. From the time dependence of the Ce^{134} activity, the Pr^{134} halflife was found to be 36 min (mean value 40±7 min). The same period was observed for the 720-kev gamma

New neutron-deficient ...

component; it possibly arises on Pr^{134} decay. From the La decay curve the existence of the following isotopes could be determined: $La^{132,133}$ (4.3hrs), La^{131} (1.1 hrs) and an isotope with A=129 and a 20-min halflife - probably La^{129} with ~24 min. The gamma spectrum of the Ce fraction has a 80±15-kev peak; that of the La fraction peaks at 115±20 kev and 175±15 kev and a 2.2-hr halflife, which could be attributed to Ba^{129}. In the Ce fraction also a 13-min activity and gamma peaks at 80±15, 315±20 and 745±20 kev (~15 min) were observed. From this the 129-isobar decay series is assumed to be $Ce^{129} \xrightarrow{\sim 13 min} La^{129} \xrightarrow{\sim 20 min} Ba^{129} \xrightarrow{2.2 hr} \ldots \rightarrow Xe^{129}$. There are 2 figures.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the Academy of Sciences USSR)

PRESENTED: August 27, 1962, by A. P. Vinogradov, Academician
SUBMITTED: July 27, 1962

L 19526-65 EWT(1)/EWT(m)/EWG(v)/FCC/EWA(d)/EEC-4/E2C(t)/EWA(h) Pb-4/
Po-4/Pe-5/Pq-4/Pae-2/Peb/Pi-4 DIAAP/ASD(f)-2/AFWL/AFETR/S3D/APHDC/ESD(t)
ACCESSION NR: AP5000419 GW/WS S/0007/64/000/012/1219/1227

AUTHORS: Lavrukhina, A. K.; Kuznetsova, R. I.; Sataroya, L. M.

TITLE: The rate of radioactive isotope formation in chondrites by cosmic rays

SOURCE: Geokhimiya, no. 12, 1964, 1219-1227

TOPIC TAGS: geochemistry, meteorite, cosmic ray

ABSTRACT: The interaction between cosmic rays and nuclei of elements commonly occurring in meteorites has been difficult to study because of the variety of minerals and phases in which these elements are found. Because of this, little information has been gained concerning the rate of isotope production by cosmic radiation in stony meteorites. As an approach to this problem, the authors studied the radioactive products from interaction between protons having energies of 120 and 660 Mev and aluminum nuclei. This element has an atomic weight and an atomic number comparable to the weighted mean values of elements in chondrites (those about which information is desired). Experimental results show that when the numerical difference between atomic numbers of the target element and of the radioactive product is less than 10, the formation cross section remains unchanged in the range of proton energies from 120 Mev to 28 Gev. If the difference is

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ACCESSION NR: AP5000419

greater than 10, the formation cross section of isotopes increases markedly with increase in proton energies from 120 Mev to 1 Gev. A semi-empirical formula was used to compute these formation cross sections, and the results agree with experimental measurements for a proton energy of 660 Mev. The maximal rate of isotope formation from cosmic rays was computed on the basis of average elemental composition for the center of a chondrite 10 cm in radius. The results are in fair agreement with the observed ratio of decay in the Harleton chondrite, but are only about one-half the values observed for the Bruderheim chondrite. Apparently secondary particles, especially low-energy neutrons, played an important role in the isotope formation of the latter chondrite. These particles were not considered in the computations. Lack of knowledge of exact chemical composition and dimensions of these two chondrites makes it difficult to make any more detailed comparison. Orig. art. has: 4 tables and 6 formulas.

ASSOCIATION: Institut geokhmii i analiticheskoy khimii im. V. I. Vernadskogo, AN SSSR, Moscow (Institute of Geochemistry and Analytical Chemistry, AN SSSR)

SUBMITTED: 13Jul64 ENCL: 00

SUB CODE: AA,ES NO REF SOV: 009 OTHER: 024

Card 2/2

VONOGRADOV, A.P., akademik; LAVRUKHINA, A.K.; REVINA, L.D.

Nuclear reactions in iron meteorites. Meteoritika no.24: 22-28 '64. (MIRA 17:5)

LAVRUKHINA, A.K.; KOLESOV, G.M.

Study of the nuclear disintegration products of rare-earth elements. Radiokhimiia 6 no. 1:62-66 '64. (MIRA 17:6)

LAVRUKHINA, A.K.; RODIN, S.S.

Review of Ed. C.E. Crouthamel's book "Progress in nuclear energy (Analytical chemistry. Vol.3)." Zhur. anal. khim. 19 no.3:403 '64. (MIRA 17:9)

L 3858f-65 EWT(m)/EWA(h)
ACCESSION NR: AP5000091 S/0030/65/000/002/0089/0090

AUTHOR: Lavrukhina, A. K. (Doctor of chemical sciences) 50 13

TITLE: Third radiochemical conference

SOURCE: AN SSSR. Vestnik, no. 2, 1965, 89-90

TOPIC TAGS: radiochemistry, radioactive material, radioisotope, radioactive carbon

ABSTRACT: The Third Radiochemical Conference took place in Liblitsy from September 28 to October 1, 1964. It was organized by the Nuclear Chemistry section of the Czechoslovakian Chemical Society with the participation of scientists from Hungary,

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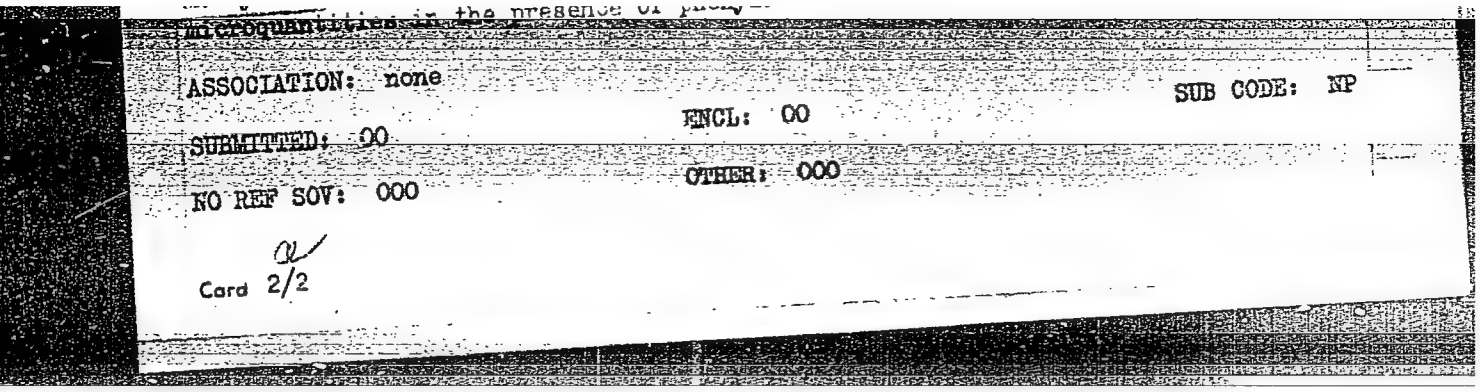
L 38588-65
ACCESSION NR: AP5008091

by the C^{14} tracer, and the compounds tagged by I^{131}. K. Beren and G. Nad' reported on the method of F^{18} separation without a carrier. The second session was dedi- [illegible] the use of radioactive isotopes in technology. O. Shtepan discussed the [illegible] currents during glass me[illegible]



microquantities in the presence of [illegible]

ASSOCIATION: none

SUB CODE: NP

SUBMITTED: 00

ENCL: 00

NO REF SOV: 000

OTHER: 000

Card 2/2

LAVRUKHINA, A.K.; KUZNETSOVA, R.I.; SATAROVA, L.M.

Formation rate of radioactive isotopes in chondrites under the action of cosmic rays. Geokhimiia no.12:1219-1227 D '64. (MIRA 18:8)

1. Institut geokhimii i analiticheskoy khimii imeni V.I.Vernadskogo AN SSSR, Moskva.

L 7696-66 EWT(1)/EWA(d) GW

ACC NR: AP5028896 SOURCE CODE: UR/0011/65/000/012/0003/0011

44
B

AUTHOR: Lavrukhina, A. K. 44,55

ORG: Institute of Geochemistry and Analytical Chemistry im. V. I. Vernadskiy, AN SSSR (Institut geokhimii i analiticheskoy khimii AN SSSR) 44,55

TITLE: Investigating the evolution of meteoritic matter from the effects of the nuclear reactions induced by cosmic rays 44,55 12

SOURCE: AN SSSR. Izvestiya. Seriya geologicheskaya, no. 12, 1965, 3-11

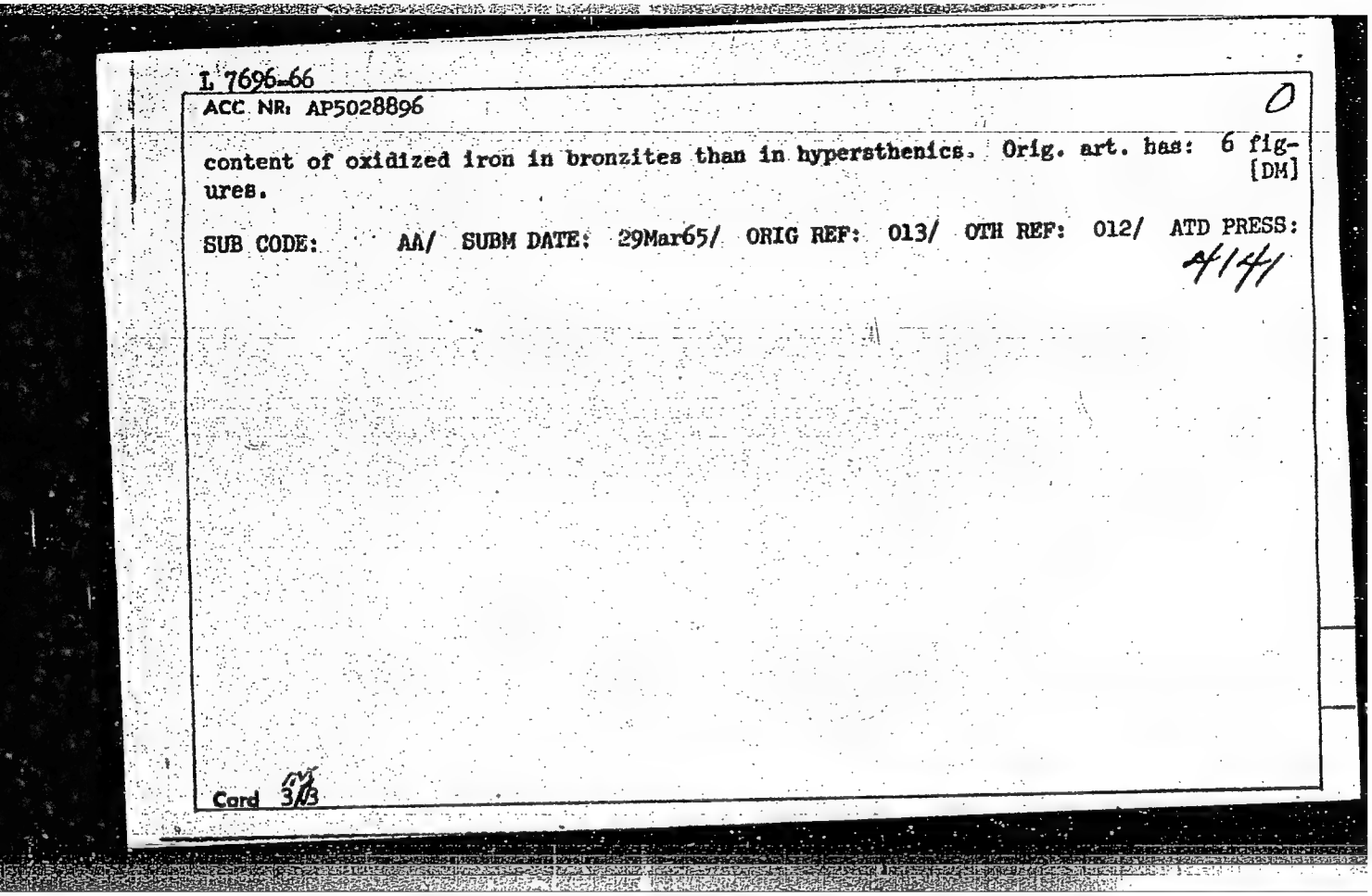
TOPIC TAGS: meteorite, asteroidal body, chondrite, geochemistry, cosmogony, meteoritic matter, cosmic ray, radioactive dating, meteoritics

ABSTRACT: Current theories on the origin, age, and composition of meteorites are evaluated against a background of new data obtained from orbital studies, geochemical analysis, and radioactive methods of age determination. Thus, for example, V. G. Fesenkov has determined that the orbit of the Sikhote-Alin' meteorite was typically asteroidal, while E. Anders, on the basis of orbital studies, has traced the parent bodies of meteorites to 34 asteroids intersecting the orbit of Mars. A. A. Yavnel' has developed a meteorite classification system, based on the nickel content of the meteoritic metal, that indicates a close genetic relationship between all meteorites and suggests a common origin. Three model theories of meteorite formation and evolution are discussed: 1) the Urey model in which achondrites and iron meteorites are

Card 1/3 UDC: 522.6

0701.2114

believed to have been formed in primary bodies of lunar dimensions, while chondrites were formed in secondary bodies of asteroidal size from the ducts of disintegration of the primary bodies; 2) the model, attributed to Anders and Ringwood, involving the differentiation of matter from a parent body; and 3) the model, attributed to Vinogradov and Wood, in which chondrules are believed to have developed from a photo-planetary dust cloud. Examination of age data obtained by methods based on the decay of all natural radioactive elements (U^{238}, Re^{187}, K^{40}, Rb^{87}) indicates that meteoritic matter solidified some 4.5 million years ago. In the light of the hypothesized common process of formation of all bodies of the solar system from the protoplanetary cloud, this determination of the time of solidification of the matter of the solar system is considered to be a major advance in meteoritics. Data now available indicate three possible processes whereby meteorites developed into separate astronomical bodies: 1) Larger bodies disintegrated into progressively smaller meteoritic bodies. 2) Meteorites falling onto the earth were actually formed on the moon when other meteorites originating in the asteroid belt collided with the earth's satellite. In this process the surface layer of the moon provided the matter found in so-called hypersthenic meteorites, while matter from the lunar interior entered into the composition of so-called bronzite meteorites. 3) Hypersthenic meteorites originated in the collision and subsequent disintegration of large asteroids some 500,000,000 years ago. It is concluded, however, that all available data on bronzite meteorites attest to their formation about 5,000,000 years ago in the disintegration of a single primary body whose matter did not undergo the changes evident in hypersthenic meteorites. This is in accord with the determination of a higher content of metallic iron and lower



L 7696-66
ACC NR: AP5028896 O

content of oxidized iron in bronzites than in hypersthenics. Orig. art. has: 6 figures. [DM]

SUB CODE: AA/ SUBM DATE: 29Mar65/ ORIG REF: 013/ OTH REF: 012/ ATD PRESS: 4141

Card 3/3

LAVRUKHINA, A.K.

Meteorites and their use in studying cosmic rays. Izv. AN SSSR. Ser.fiz. 29 no.10:1838-1842 O '65. (MIRA 18:10)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo AN SSSR.

LAVRUKHINA, Avgusta Konstantinovna; KOLESOV, Gennadiy Mikhaylovich; KALYUZHNAYA, T.P., red.

[Isotopes in the universe] Izotopy vo Vselennoi. Moskva, Atomizdat, 1965. 239 p. (MIRA 18:8)

LAVRUKHINA, A.K.; RUTKOVSKIY, V.M.; IBRAYEV, T.A.; YUKINA, L.V.

Study of the variations in cosmic rays based on their effects on stony meteorites. Izv. AN SSSR. Ser. fiz. 29 n.6:841-845 Je '65. (MIRA 18:10)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo AN SSSR.

GOL'DANSKIY, V.I., otv. red.; LAVRUKHINA, A.K., prof., doktor khim. nauk, otv. red.; RODIN, S.S., red.; PROKOP'YEV, Ye.P., red.

[Nuclear chemistry] IAdernaia khimiia. Moskva, Nauka, 1965. 327 p. (MIRA 18:12)

1. Akademiya nauk SSSR. Institut geokhimii i analiticheskoy khimii. 2. Chlen-korrespondent AN SSSR (for Gol'danskiy).

LAVRUKHINA, A.K., prof.

Meteorites and space chemistry. Priroda 55 no.1:33-44 Ja '66. (MIRA 19:1)

1. Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR, Moskva.

L 39933-66 EWT(l)/EWT(m) GW/GD

ACC NR: AT6017648 (A) SOURCE CODE: UR/0000/65/000/000/0007/0073

AUTHOR: Lavrukhina, A. K.

53
B+1

ORG: none

TITLE: Effect of nuclear reactions caused by fast protons in meteorites

SOURCE: AN SSSR. Institut geokhimii i analiticheskoy khimii. Yadernaya khimiya (Nuclear chemistry). Moscow, Izd-vo Nauka, 1965, 7-73

TOPIC TAGS: nuclear reaction, fast particle, meteorite, radioactive decay, cosmic ray, geochemistry, geophysics, cosmology

ABSTRACT: An extensive survey of the new field of nuclear space chemistry, concerned mainly with the stable and radioactive isotopes found in iron and stony meteorites is presented. The author discusses the basic problems of discovering the principles governing the origin and distribution of cosmogenic isotopes in planets, satellites, asteroids, meteorites, and cosmic dust and of explaining their role in the formation and evolution of these bodies. Such studies are heavily based on the recent development of high-sensitivity radiometers of extremely low background and mass-spectrometers for the study of microquantities of stable and radioactive cosmogenic isotopes. The survey embraces the following topics: chemical composition of meteorites, isotopic composition of the elements in meteorites, variations in the content of certain

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L 39933-66

ACC NR: AT6017648 O

stable cosmogenic isotopes in meteorites, cosmogenic radioisotopes, nuclear reactions in meteorites, methods of determining the rates of formation of cosmogenic isotopes in meteorites, rates of formation of cosmogenic isotopes in iron meteorites, rates of formation of cosmogenic isotopes in stony meteorites. Orig. art. has: 26 tables, 13 figures.

SUB CODE: 03,20,08/ SUBM DATE: 03Nov65/ ORIG REF: 052/ OTH REF: 291

Card 2/2 HS

L 40244-66 EWT(1)/EWT(m)/FCC/T/EWP(t)/ETI IJP(c) GW/JD

ACC NR: AT6020807 SOURCE CODE: UR/2534/65/000/026/0091/0101

60
371

AUTHOR: Lavrukhina, A. K.

ORG: none

TITLE: Study of space and time variation of cosmic rays based on the effects of nuclear fission in meteorites

SOURCE: AN SSSR. Komitet po meteoritam. Meteoritika, no. 26, 1965, 91-101

TOPIC TAGS: cosmic ray, cosmic ray intensity, meteorite, nuclear fission, solar activity

ABSTRACT: In this article the author discusses the spatial distribution of cosmic rays in the solar system, the time variations of the intensity of cosmic rays, and the intensity of cosmic rays along meteoritic orbits. The information obtained by means of meteorites concerning the intensity of cosmic rays permits the conclusion that the intensity of cosmic rays changes depending upon the intensity of solar activity even at appreciable distances from the sun, in any case at a distance of several astronomical units and that the intensity of cosmic rays is approximately by a factor of 2 higher in the region of meteoritic orbits in comparison with that in the vicinity of the earth. The data presented on the intensity of cosmic rays and their spatial distribution in the solar system are undoubtedly still insufficiently accurate and incom-

Card 1/2

SHEYNIN, Yulian Mikhaylovich; RUBINSHTEYN, M.I., doktor ekon. nauk, otv. red.; LAVRUKHINA, I.M., red.; ASTAF'YEVA, G.A., tekhn. red.

[Science and militarism in the U.S.A.; scientific and technological revolution in military art and the origination of conditions for the crisis of militarism] Nauka i militarizm v SShA; nauchno-tekhnicheskii perevorot v voennom dele i vozniknovenie predposylok krizisa militarizma. Moskva, Izd-vo AN SSSR, 1963. 590 p. (MIRA 16:12)
(United States--Military art and science)
(United States--Militarism)

ANTONOV, E.I., inzh.; KUZNETSOV, D.P., inzh.; LAVRUKHINA, T.P., inzh.; TSYRKIN, I.Z., inzh.

Redesigning of the EP-3-600 ejector for operation on steam pressures of 6 atm. Energetik 10 no.5:13-16 My '62. (MIRA 15:5)
(Steam turbines)

LAVRUSEVICH, A.I.

New genus Chavsakia from Ludlow sediments in the Zeravshan-Gissar mountain region. Izv. Otd. est. nauk AN Tadzh. SSR no.1:35-41 '59.
(MIRA 13:3)

1. Institut geologii AN Tadzhikskoy SSR.
(Arg Valley--Corals, Fossil)

LAVRUSEVICH, A.I.

Holomophyllum with a scaly epitheca from Silurian sediments of the Zeravshan and Gissar Ranges. Dokl.AN Tadzh.SSR 3 no.4:21-25. '60.
(MIRA 14:4)

1. Institut geologii AN Tadzhikskoy SSR. Predstavleno akademikom AN Tadzhikskoy SSR A.P.Nedzvetskim.
(Tien Shan--Corals, Fossil)

LELESHUS, V.L.; MENAKOVA, G.N.; LAVRUSEVICH, A.I.

Silurian stratigraphy of the southern Tien Shan. Dokl.AN SSSR 133 no.1:196-198 Jl '60. (MIRA 13:7)
(Daurich region--Geology, Stratigraphic)

LAVRUSEVICH, A.I.; MUCHAIDZE, D.R.

Stratigraphy of the calcareous shale formation of the eastern part of the Zeravshan-Gissar Range. Izv. Otd. geol.-khim. i tekh. nauk AN Tadzh.SSR 1:61-67 '60. (MIRA 15:1)

1. Upravleniye geologii i okhrany nedr pri Sovete Ministrov Tadzhikskoy SSR.

(Zeravshan Valley--Shale)

LAVRUSEVICH, V., laureat Stalinskoy premii.

Universal metal shoring for dock work. Mor. i rech.flot 14 no.5: 27-29 My '54. (MLRA 7:7)
(Dry-docks)

ZAGLUBOTSKIY, P.M.; DURNOV, G.P.; LAVRUSHKVICH, V.V.; MIKHAYLENKO, V.I.; IVANOV, V.M., spetsred.; SHUIN, V.I., red.; FORMALINA, Ye.A., tekhn.red.

[Practices of efficiency promoters in ship repairing] Opyt ratsionalizatorov v sudoremonte. Moskva, 1959. 53 p. (MIRA 13:9)

(Ships--Maintenance and repair)

UGOLEVA, N.A., BESKINA, S.R., LAVRUSHENKO, V.A.,

"Biochemical and histochemical studies of nuclei acids in chick embryo chorioallantoic membrane infected with Sendai virus.

Report submitted to the Intl. Congress for Microbiology
Montreal, Canada 19-25 Aug 1962

LAVRUSHENKOVA, Z.A., Cand Med Sci -- (diss) "~~Additional~~ Accessory sinuses of the nose in the normal and pathological case ~~in~~ (under) X-ray ~~ligi-lighting~~ exposure." Smolensk, 1958, 17 pp

(Seonnd Mos State Med Inst im N.I. Pirogov) 250 copies

(KL, 32-58, 112)

LAVRUSHENKOVA, Z. A.

USSR / Human and Animal Morphology (Normal and Pathological). Skeleton. S

Abs Jour : Ref Zhur - Biol., No 21, 1958, No 97137

Author : Lavrushenkova, Z.A.
Inst : Smolensk Medical Institute
Title : Variations of Frontal Pauses According to Data of Roentgenological Investigation.

Orig Pub : Tr. Smolenskogo med. in-ta, 1957, 6, 291-296

Abstract : On 1,154 roentgonograms of paranasal pauses of sinuses of humans aged from 16-77 years (510 males and 644 females), the following classification of frontal sinuses (FS) was established: absence of both FS (2.34% of cases), unilateral development of FS (3.72%), solitary (1.37%), double cavitation (69.5%), triple cavitation (18.29%), quadruple cavitation (3.81%), quintuple cavitation (0.44%), multiple cavitation of FS (0.17%). Within the limits of these groups, more detailed subdivisions are singled out.

Card 1/1

ALEKHIN; BORISOV; VOLKOV; GRIGOR'YANTS; GRUZDEV; DICH; DUSEYEVA; LAVRUSHIN; LOPINSKIY; IVANOVA,; KONKIN; MEOS; MIKHAYLOV; MOGILEVSKIY; PAKSHVER; ROGOVIN; TAIROV; SHIFRIN

Deserving workers of the synthetic fibers industry. Khim. volok. no.3:79 '61. (MIRA 14:6)
(Birger, Georgii Efimovich, 1886)

ACC NR: AT6020807

plete, and it is necessary to conduct further detailed investigations to explain the character of the distribution of cosmogenic isotopes in relation to the chemical composition and size of meteorites and to the depth of occurrence of the investigated specimens in the meteorite. Orig. art. has: 5 tables, 7 figures, and 1 formula.

SUB CODE: 03,04,18/ SUBM DATE: 00/ ORIG REF: 001/ OTH REF: 032

Card 2/2 MLP

L 37000-66 EWT(1) GW

ACC NR: AP6023200 SOURCE CODE: UR/0020/66/168/006/1275/1278

50
47
B

AUTHOR: Lavrukhina, A. K.

ORG: Institute of Geochemistry and Analytical Chemistry im. Vernadskiy, AN SSSR (Institut geokhimii i analiticheskoy khimii AN SSSR)

TITLE: Determination of preatmospheric meteoritic dimensions

SOURCE: AN SSSR. Doklady, v. 168, no. 6, 1966, 1275-1278

TOPIC TAGS: meteoric size, terrestrial atmosphere, cosmogenetic isotope, cosmic ray, excitation function, nuclear reaction, proton energy, secondary nuclear particle, METEOR, COSMIC RAY EFFECT, COSMIC DUST

ABSTRACT: Meteors are the source of cosmic matter. Meteoric size before entry into the terrestrial atmosphere is unknown. The only way to determine the size of meteors before they enter the terrestrial atmosphere is to study the formation speed of cosmogenetic isotopes generated by the interaction of cosmic rays with the meteoric matter. This method is based on the difference in excitation functions of various nuclear-reaction product groups. Nuclear-reaction products are classified into two groups with $\Delta A < 10$ and $\Delta A > 10$, where ΔA is the difference of products gained by protons of different energies. The speed of isotope $H_{\Delta i}$ formation in the i-point in the meteor body is a

Card 1/2 UDC: 523.51+539.17+523.165

L 37000-66

ACC NR: AP6023200

3

function of the intensities of primary cosmic radiation and active secondary nuclear particles. The particle spectrum and the energy function determine the role of each kind of particle in the A_i isotope formation. Isotope formation in meteors of various radii is distributed differently, depending upon the length of the radius and the production class group. The quantity of secondary mesons and protons was determined from their spectra as obtained in the atmosphere. Nomograms were drawn for isotopes from the data of a series of meteoric bodies. The accuracy of the author's method is based on radiometric determination of low cosmic-ray activity and their stability in the solar system. The author expresses thanks to L. D. Revina, T. A. Ibrayev and T. I. Kholodkovskaya for help. Orig. art. has: 1 table, 3 figures, and 2 formulas. [EG]

SUB CODE: 03/ SUBM DATE: 25Aug65/ ORIG REF: 005/ OTH REF: 009
ATD PRESS: 5035

Card 2/2

L 40347-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6019436 (A) SOURCE CODE: UR/0007/66/000/003/0281/0290

AUTHOR: Lavrukhina, A. K.; Kolesov, G. M.; Kalicheva, I. S.; Akol'zina, L. D.

ORG: Institute of Geochemistry and Analytical Chemistry im. V. I. Vernadskiy, AN SSSR, Moscow (Institut geokhimii i analiticheskoy khimii AN SSSR)

TITLE: Activation determination of Ce, Eu, Sc, Ba, U, and P in dark and clear varieties of Kunashak and Pervomayskiy village chondrites

SOURCE: Geokhimiya, no. 3, 1966, 281-290

TOPIC TAGS: neutron activation analysis, meteorite, radioisotope, cerium, europium, scandium, barium, uranium, phosphorus

ABSTRACT: Neutron activation analysis was used to determine various elements in Kunashak and Pervomayskiy village chondrites. The samples were irradiated with a neutron flux of 1.2×10^{13} n/cm^2 sec. The content of Eu, Sc, Ba, and U in the clear varieties of chondrites of olivine-hypersthene composition generally correspond to the average content previously found in chondrites of this type. The concentration of Eu, Ce, and Sc in hypersthenic chondrites is higher than in enstatite chondrites. In nonmagnetic fractions of the investigated meteorites as compared to their unseparated samples, the content of Ce, Eu, and Sc is higher, owing to the lithophilous character of these elements. The concentration of Eu, Sc, Ba, and U in the dark and clear varieties of Kunashak meteorite is approximately the same. The P concentration in the dark varieties of

Card 1/2 UDC: 550.42+552.6

chondrites is higher than in the clear ones. Data on cerium are of particular interest: the Ce content in clear varieties is about twice that in dark ones, which correlates with the lower concentration of metallic iron and higher concentration of ferrous iron, manganese, and chromium in clear varieties for the same total content of iron and troilite in both varieties. These data and also data on the content of inert gases indicate that the substance of the clear variety of the chondrites studied had undergone a more extensive oxidation than the substance of the dark variety, i. e., that the two varieties had a different thermal history. Authors thank T. F. Yakubova for assistance in the measurement of the radioisotopes, Yu. V. Yakovlev, N. N. Dogadkin, and A. Z. Miklishanskiy for placing the samples in the reactor, and V. Ya. Kharitonova and M. I. D'yakonova, on the staff of the Committee on Meteorites, AN SSSR (Komitet po meteoritam AN SSSR) for providing the meteorite samples. Orig. art. has: 6 figures and 4 tables.

SUB CODE: 03,07/ SUBM DATE: 31Jul65/ ORIG REF: 016/ OTH REF: 014

CHUYANOV, A., inzhener; OL'SHANSKIY, I., inzhener; LAVRUSHIN, A., inzhener.

The leader in the meat packing industry; twentieth anniversary of the Moscow Meat Combine. Mias. ind. SSSR 24 no.6:5-8 '53. (MLRA 6:12)
(Moscow--Meat industry) (Meat industry--Moscow)

LAVRUSHIN, A., inzhener; OL'SHANSKIY, I., inzhener.

Re-equipping shops of the Moscow meat combine. Mias.ind. SSSR. 25 no.5:12-17 '54. (MLRA 7:11)
(Packing houses)

LAVRUSHIN,A., inzhener; OL'SHANSKIY,I., inzhener

New efficiency methods in the Moscow meat combine. Mias. ind. SSSR 26 no.3:53-55 '55. (MLRA 8:9)
(Moscow--Meat industry)

LAVRUSHIN, A.

We are installing new lines and automatic machinery. Mias.ind. SSSR 26 no.4:24 '55. (MLRA 8:10)

1. Moskovskiy myasokombinat imeni A.I.Mikoyana
(Moscow--Packing houses--Equipment and supplies)

LAVRUSHIN, A.Ya.; OL'SHANSKIY, I.I.; ABRAMOV, N.D.; STAL'MAKOVA, M.I.; FILATKIN, I.G.; BELOGOLOVAYA, N.G.; STEPANOV, A.S., spetsred.; VASIL'YEVA, G.N., red.; CHEBYSHEVA, Ye.A., tekhn. red.

[Meat industry; collection of articles] Miasnaia promyshlennost'; sbornik. Moskva, Pishchepromizdat. (Obmen peredovym tekhnicheskim opytom). No.14. [Practices of efficiency promoters of the Moscow Meat Combine] Opyt ratsionalizatorov Moskovskogo miasokombinata. 1956. 25 p. (MIRA 11:10)

1. Russia (1923- U.S.S.R.) Ministerstvo promyshlennosti myasnykh i molochnykh produktov. Otdel tekhnicheskoy informatsii. (Moscow--Meat industry)

LAVRUSHIN, A., inzhener; OL'SHANSKIY, I., inzhener.

Suggestions of meat combine efficiency promotors. Mias. ind. SSSR 27 no.4:48-50 '56. (MLRA 9:10)

1. Moskovskiy myasokombinat.
(Meat industry--Equipment and supplies)

LAVRUSHIN, A., inshener.;OL'SHANSKIY, I., inzhener.

Suggestions of efficiency promoters. Mias. ind. SSSR no.2:52-53 '57.
(MLRA 10:5)

1. Moskovskiy myasokombinat.
(Meat industry--Equipment and supplies)

LAVRUSHIN, A.

LAVRUSHIN, A., inzhener; OL'SHANSKIY, I., inzhener.

Suggestions of efficiency promoters of the Moscow Meat Combine.
Miasn. ind. SSSR 28 no.3:52-53 '57. (MLRA 10:6)
(Meat industry--Equipment and supplies)